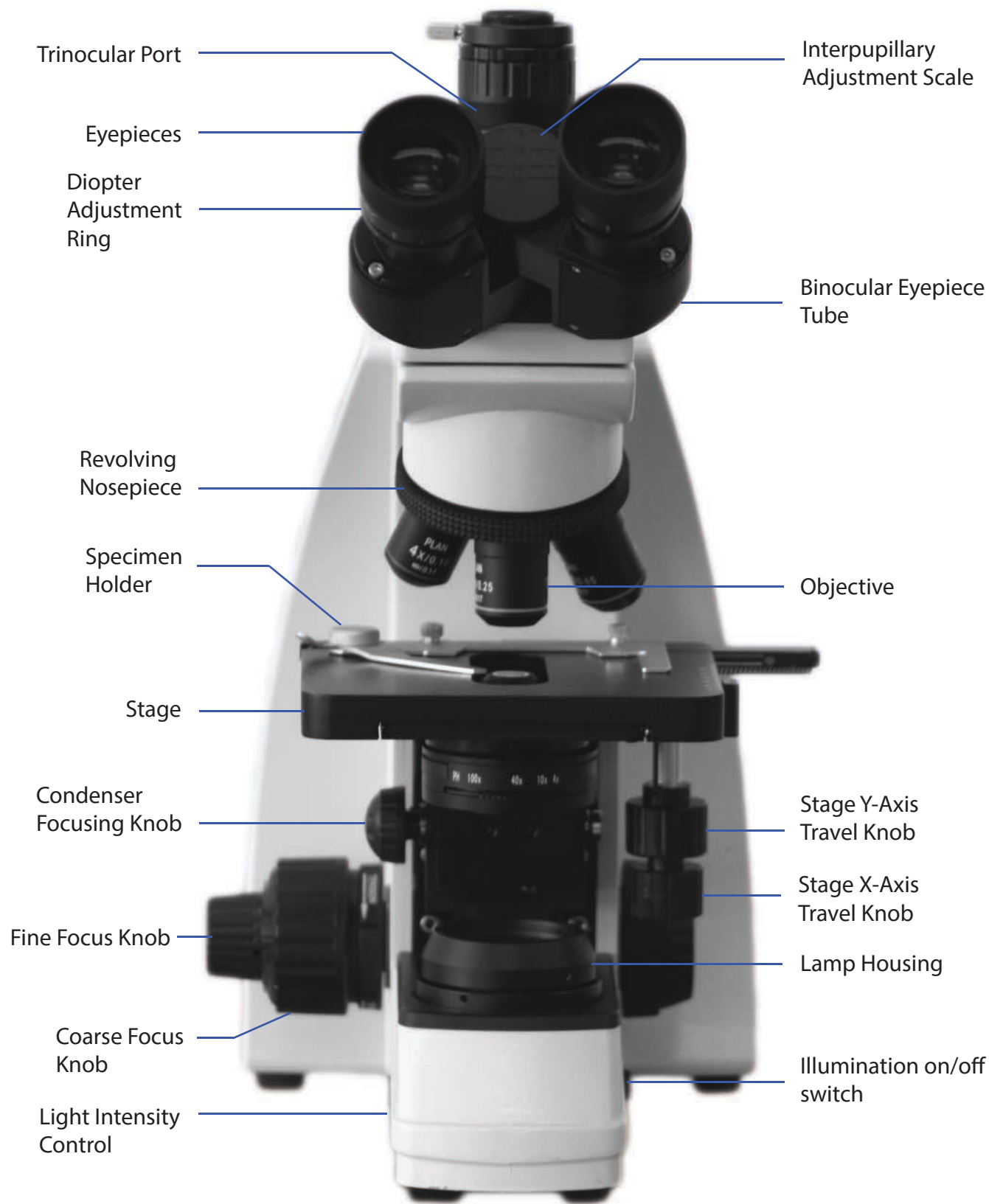




Richter Optica

info@richter-optica.com

Instructions for Models:
U2B, U2T, U2-LCD, U2D
University Laboratory Biological Microscope



Thank you for your purchase of a Richter Optica microscope. The information in this manual is provided to answer most questions that can arise when operating your microscope and to help you avoid unnecessary maintenance expenses in the future.

Please carefully read instructions before operating microscope. Nomenclature used to describe components and controls are identified on opposite page.

UNPACKING

Do not discard styrofoam container or packing materials until you are sure shipment is complete and undamaged (retain styrofoam shipping container to store your microscope when it is not in use). Remove all tape and packing material used to protect microscope during shipment. Make certain lens surfaces do not come in contact with dirt, fingerprints or oil. Damage of lens surfaces occur when they come in contact with such contaminants, and image quality is reduced.

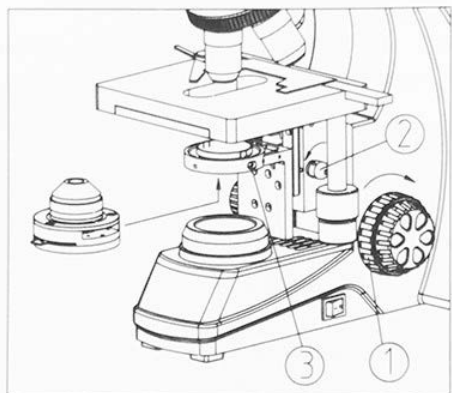
SETTING UP THE INSTRUMENT

Avoid placing the instrument in locations exposed to direct sunlight, dust, vibration, high humidity and where it is difficult to unplug the power supply cord.

ASSEMBLING THE MICROSCOPE

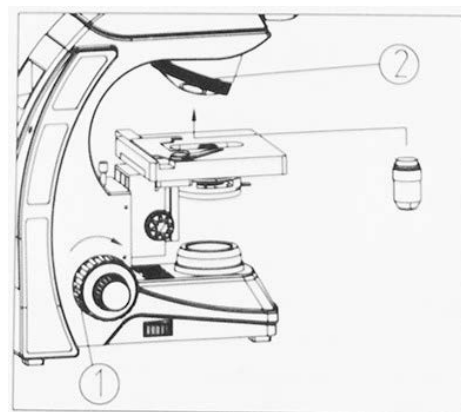
1. Objectives

Lower the stage completely (1). Screw the objectives into the revolving turret nosepiece (2) so that each clockwise rotation brings the next highest magnification objective into position.



2. Condenser

Raise the stage by turning the coarse focus knob (1). Raise the condenser carrier by turning the condenser focus knob (2). Insert the condenser into the mount with aperture scale facing forward towards the user. Secure with the condenser clamp screw (3). Turn the condenser focus knob to raise the condenser as far as it will go.

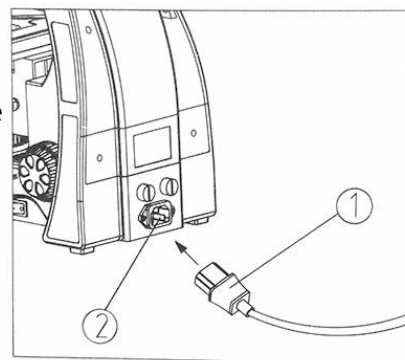


3. Eyepieces

Use the same magnification eyepieces for both eyetubes. To lock the eyepiece, insert each eyepiece into the eyetube completely and tighten the small clamping screws.

4. Power Cord

Connect the socket of the power cord (1) into the AC inlet on the rear of the base of the microscope (2). Plug in the other end of the cord to an AC outlet with ground conductor.



MICROSCOPY

1. Coarse and Fine Focusing

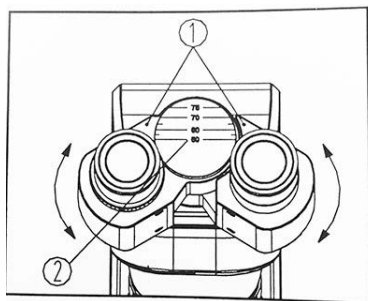
Focusing is done with coarse and fine focus knobs at the left and right of the microscope stand. The direction of vertical movement of the stage corresponds to the direction the focus knobs are turned.

Never attempt either of the following actions, since doing so will damage the focus mechanism:

- Rotate the left or right knob while holding the other stationary
- Turning the coarse and fine focus knobs further than their limit.

2. Coarse Focus Tension Adjustment

To increase the tension, turn the tension adjustment ring located on the inside of the coarse focus knob in the direction indicated by the arrow.

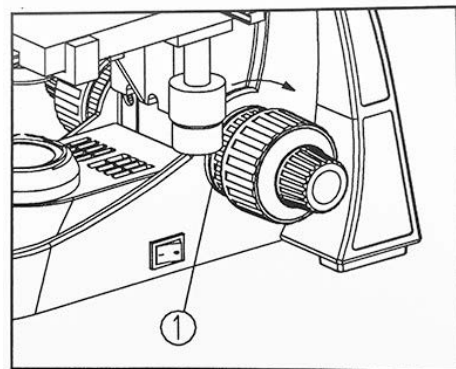


3. Interpupillary Distance Adjustment

Before adjusting the interpupillary distance, bring a specimen into focus using the 4x objective.

While looking through the eyepieces move the eyetubes either further apart or closer together until the right and left field of view become one. On either side of the scale (2) line up the dots (1).

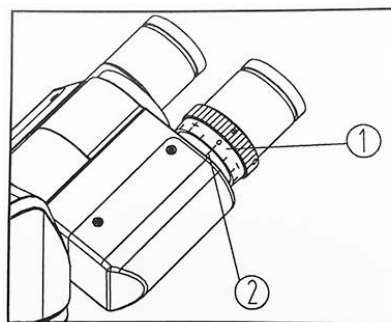
This adjustment will enable the user to see the specimen with both eyes.



4. Diopter adjustment

Diopter adjustment will compensate for the differences in vision between the left and right eyes. In addition to making observation with both eyes easier, it will also help reduce the extent to which focusing is lost when the objective magnification is changed. In particular, this occurs when a low magnification objective is used.

Rotate the nosepiece until the 4x objective "clicks" into position. Using the fine and/or coarse focus knobs, focus the microscope until the image is at its sharpest.

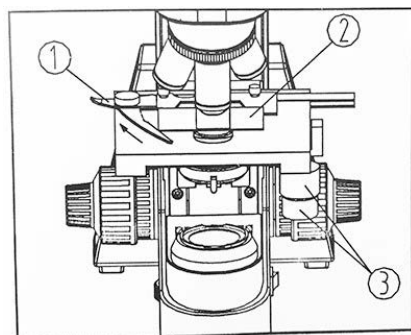


The left and right eyepieces have separate focusing provisions to compensate for slight differences in the focusing of each eye. Using the right eye only and viewing through the right-hand eyepiece, adjust the diopter until the image is clearly in focus. Using the left eye only and viewing through the left-hand eyepiece with its independent diopter-focusing ring, focus until the specimen is at its sharpest. The microscope should now be ready for binocular viewing. When switching between users, note the setting on the scale (2) on the eyepieces and you can quickly change the proper setting back for each user.

MICROSCOPY

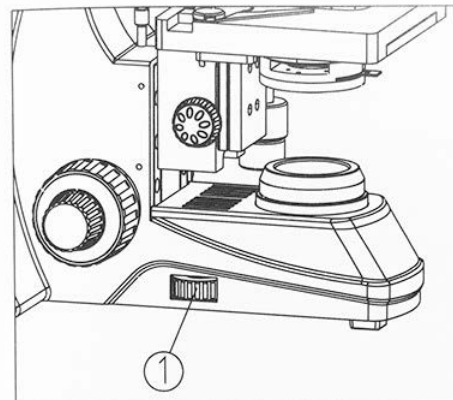
5. Adjust Light Intensity

When the power switch is turned on, adjust the light adjustment knob (1) on the side of the microscope to increase the voltage and brightness.



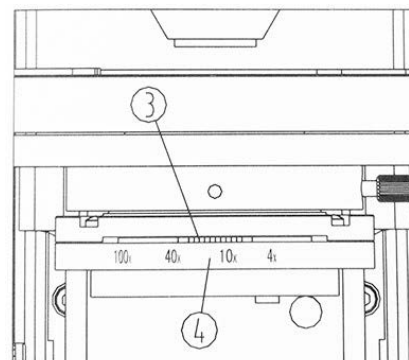
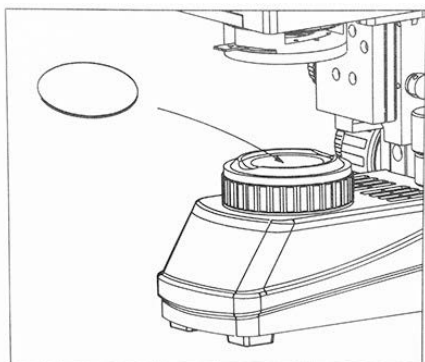
6. Specimen Holder

Push the finger lever (1) on the specimen holder back to place the slide (2) on the mechanical stage. Control the X-Y axis with the knobs on the right side of the microscope (3) to move the sample left-to-right and forward-and-backward on the stage.



7. Adjust the Iris Diaphragm

Images will have the best contrast and resolution when the numerical aperture (NA) of the iris diaphragm is set to match the NA of the objective lens being used. Move the lever (3) on the iris diaphragm so that it lines up with the corresponding objective setting (4).

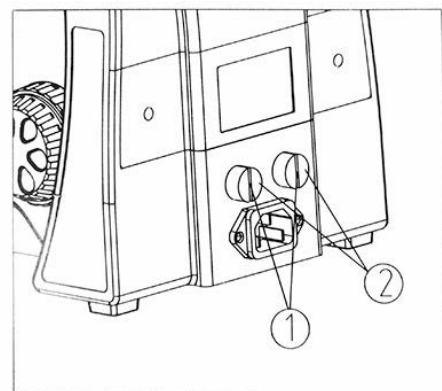


8. Using the Filter

Place the filter over the illuminator (see image at left) to increase contrast or change the background lighting of your microscopy image.

9. Replacing the Fuse

Make sure the microscope is off and unplugged. Remove the power cord. Remove the fuse groups (1) from the microscope base (2) by inserting a coin or flathead screwdriver and twisting counter-clockwise. Install a new fuse and replace fuse groups. Fuse: 250V, 3.15A.



TROUBLESHOOTING

Optical

Problem	Possible Cause
Dust or dirt in field of view.	Dust or dirt on objective, filter, condenser or eyepiece
Poor image (low contrast or resolution)	Condenser is set too low or too high
	Aperture diaphragm closed too far
	No cover glass
	Too thick or thin cover glass
	Immersion oil not used on immersion procedure
	Air bubbles in immersion oil
	Immersion oil used on a dry objective
	Greasy residue on eye lens
	Incorrect illumination
Uneven Focus	Specimen holder not fixed securely on stage
	Specimen not secured in position
	Specimen tilted on stage
Image tinged yellow	Lamp voltage is set too low
	Blue filter is not being used
Focusing is not possible with high magnification objectives	Slide is upside down
	Cover glass is too thick
	Eyepiece diopter not adjusted
Insufficient parfocality of objectives	Eyepiece diopter not adjusted
No cohesion of binocular image	Magnification or field of view of left and right eyepiece differ
	Interpupillary distance not adjusted
	Eyepiece diopter not adjusted

Optical

Problem	Possible Cause
High magnification objectives strike the specimen when changing over from low to high magnification	Slide is upside down
	Cover glass is too thick
Insufficient parfocality of objectives	Eyepiece diopter not adjusted
Eye strain or fatigue	Interpupillary distance not adjusted
	Diopter adjustment not made
	Field of view of left and right eyepiece differ
	Inadequate illumination

Electrical

<i>Lamp does not light</i>	<i>Power supply not plugged in</i>
	<i>Lamp not installed</i>
	<i>Lamp burned out</i>
<i>Inadequate brightness</i>	<i>Specified lamp not being used</i>
<i>Lamp blows out immediately</i>	<i>Specified Lamp not being used</i>
<i>Lamp flickers</i>	<i>Connectors are not securely connected</i>
	<i>Lamp near end of service life</i>
	<i>Lamp not securely plugged into socket</i>

CARE AND MAINTENANCE

Do not disassemble

1. Disassembly may significantly affect the performance of the instrument, and may result in electric shock or injury and will void the terms of the warranty.
2. Never attempt to dismantle any parts other than described in this manual. If you notice any malfunction, contact your Richter Optica representative.

Cleaning the microscope

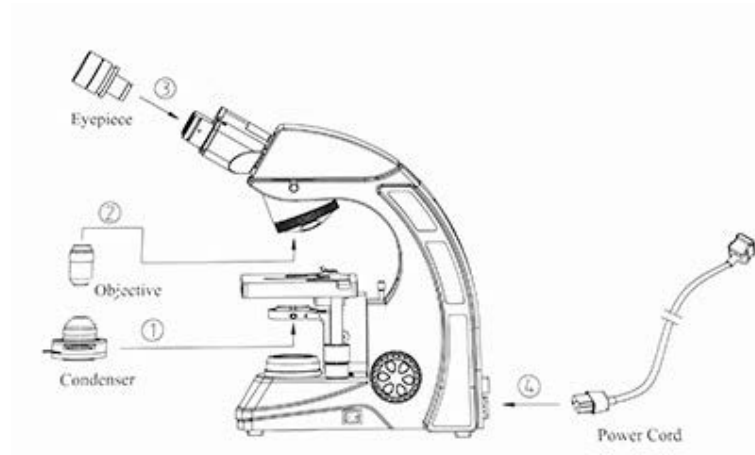
1. Do not use organic solvents such as ether; alcohol or paint thinner on painted surfaces or plastic components. Doing so could result in discoloration of painted or plastic surfaces.
2. When cleaning lenses do not use any solvents other than absolute alcohol, as they may damage lens bonding cement.
3. Do not use petroleum benzene when cleaning components such as filters or lenses.
4. Absolute alcohol and petroleum benzene are highly flammable. Keep away from open flames and when turning power switch on and off.
5. For stubborn dirt, dampen a piece of gauze with diluted neutral detergent and wipe lightly.

Disinfecting the Microscope

Follow the standard procedures for your laboratory.

When not in Use

1. When not in use, cover instrument with dust cover and store in a place in low humidity where mold is not likely to form.
2. Proper handling of the microscope will ensure years of trouble free service.
3. If repair becomes necessary, please contact Richter Optica directly at info@richter-optica.com.



Quick Assembly Guide:

- (1) Install condenser.
 - (2) Screw in objective lenses into turret nosepiece.
 - (3) Insert and secure eyepieces.
 - (4) Connect power cord.
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